

Mankins, Shankar and ASM, would not have rendered obvious the alloy composition of claims 15-18.

Applicants respectfully request reconsideration and withdrawal of the rejection.

**V. Conclusion**

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact Applicants' representative at the telephone number listed below.

Respectfully submitted,



James A. Oliff  
Registration No. 27,075

H. James Voeller  
Registration No. 48,015

**Attachments:**

Appendix  
Petition for Extension of Time  
Copy of cited Periodic Table

JAO:HJV/mmc

Date: December 12, 2002

**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

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## APPENDIX

**Changes to Specification:**

Page 4, lines 18-34:

The compositions investigated also included two-component nickel/tantalum alloys containing tantalum in the range 10-30 weight %. A particularly successful alloy contained 20% tantalum which solidifies at about 1400°C and was found to be an effective seed alloy for the superalloy CMSX4. Tantalum levels of around 30% solidify at 1360°C and are appropriate for casting single crystal components from alloys with melting points of around 1350°C.

These compositions have melting temperatures which are not less than 1300°C and not greater than 1400°C, these temperatures being appropriate for the majority of superalloys. The compositions have the added advantage of narrow solidification ranges, being not greater than 20°C, which reduce the potential for secondary crystal nucleation during solidification.

**Changes to Claims:**

Claim 6 is canceled.

Claims 19 and 20 are added.

**The following is a marked-up version of the amended claim(s):**

1. (Amended) An aluminum-free single crystal seed alloy composition comprising:

nickel; and,

in the proportion of 5 to 50 weight, % a further metal selected from the Transition Series of elements in Period VI of the Periodic Table of elements.

10. (Amended) An aluminum-free single crystal seed alloy composition comprising:

nickel; and,

in the proportion of 5 to 50 weight, % a further metal selected from the Transition Series of elements in Period VI of the Periodic Table of elements,

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wherein the alloy composition has a solidification temperature which is not less than 1300°C and not greater than 1400°C, and a solidification temperature range which is not greater than 20°C.

13. (Amended) An aluminum-free single crystal seed alloy composition consisting essentially of:

nickel; and,

~~tungsten~~ tantalum in the proportion of 13 to ~~40~~ 45 weight %,

wherein the alloy composition has a solidification temperature which is not less than 1300°C and not greater than 1400°C, and a solidification temperature range which is not greater than 20°C.

18. (Amended) An aluminum-free single crystal seed alloy composition consisting essentially of:

nickel; and,

tantalum in the proportion of 25 to 35 weight %,

wherein the alloy composition has a solidification temperature which is not less than 1300°C and not greater than 1400°C, and a solidification temperature range which is not greater than 20°C.

Periodic Table of the Elements

Period	Group Ia	Group IIa	Group IIIa	Group IVa	Group Va	Group VIA	Group VIIa	Group VIII	Group Ib	Group IIb	Group IIIb	Group IVb	Group Vb	Group VIb	Group VIIb	Group O
1	1														1	2
1s	H														He	
2	3	4														
2s2p	Li	Be														
3	11	12														
3s3p	Na	Mg														
4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
4s3d	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se
4p																
5	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
5s4d	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te
5p																
6	55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84
6s	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po
(4f)																
5d																
6p																
7	87	88	89													
7s	Fr	Ra	Ac													
(5f)																
6d																

*Lanthanide series 4f	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
**Actinide series 5f	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr